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IDIOSYNCRATIC DISTANCES: IMPACT OF MOBILE TECHNOLOGY PRACTICES ON ROLE SEGMENTATION AND INTEGRATION

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Abstract: Mobile technologies have brought convenience, flexibility and connectedness in our lives by enabling us to be reachable anywhere and anytime. All of our environments such as work and home converge through a single device and we can now receive private calls at work and professional calls during the weekend. Mobile technologies have transformed geographical distances and allow unplanned interruptions. While boundary theory suggests that individuals create, maintain and modify their boundaries in order to classify and simplify their environments, we focus here on how people use their devices and manage the boundaries that have been erased by mobile technologies. Based on an original qualitative research of twenty three mini-case studies, we identify three practices by which individuals resocialize the distance: construction of a meta-role, delegation of role separation to technological devices and ‘sedentarization’ of mobile technologies by multiplying technological devices.

Keywords: mobile technology, boundary approach, role boundary, segmentation, transition

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INTRODUCTION

Asking writers, actors, businessmen, etc. about their use of Blackberry or iPhone during their holidays, Financial Times uncovered a surprisingly eclectic range of uses of these devices.¹ Whether they are completely banned from private and/or professional life or guilty used to check emails, the ways people use their mobile technologies (their ‘practices’) are divergent but they often blur the boundaries between work and private life and thus, impact either sphere. By carrying work tasks with them into places where they are not supposed to be, mobile technologies lead users to adopt different practices to control users’ access to a world that is no longer so specifically geographically located. While some individuals had decided to eschew their use altogether, “*I stay away from those things*”, others tried to limit their access, “*I try not to use it much*” or to hide from family when checking emails “*I always hide it under a book when my wife walks into the room.*” Before the wide use of mobile technologies, interactions were generally contextualized by the location where they took place but since their advent, interactions have become increasingly decontextualized, and users have adopted a wide range of practices in their use of mobile technologies.

Following Katz and Kahn (1978), we define roles as “the building block of social systems and the summation of the requirements with which such systems confront their members as individuals”. For instance, mother, manager, wife, sister and daughter are different roles that can be enacted in the same day by only one person but each is related to a specific location or context, such as workplace and home. By allowing people to be called anywhere and anytime

¹ Financial Times, 3th of July 2009: “Leading Figures on their ideal holidays.” Last consultation: September 15th 2011. URL: <http://www.ft.com/cms/s/2/60ede3ba-6762-11de-925f-00144feabdc0.html#axzz1E2Hr3hEM>

(Tribbia, 2006), mobile technologies blur the role boundaries that were initially geographically contextualized. Although mobile technologies have improved lives in terms of convenience, flexibility and connectedness, people experience some drawbacks due to an increase use these devices.

Which are the different practices associated with mobile technology use? How have mobile technologies affected role transition? How do individuals maintain role segmentation – and transition between roles - when using mobile technologies? This paper explores how mobile technologies modify what defines a role (for instance, by disassociating it from its locational context) and the practices individuals adopt to manage this decontextualization. We here refer to Weick (2003) to define practice as being “equated with doing, concreteness, understanding, know-how and wholes” (p.454). When distances become blurred and individuals that are interacting are unable to identify what role each other is in, mobile technology users must reshape boundaries to make their roles known to each other – i.e. re-socialized them to establish the context of communication. So, people need to geographically contextualize the conversation at the beginning of the conversation (Laurier, 1999). Unless locations are given by the context of the interaction, they are missing from the dialogue and roles remains uncertain. This contribution is drawn on the analysis of twenty three case studies about the use of devices such as laptop, mobile phones, Blackberries, etc. While mobile technologies blur the boundaries between individuals, roles are blurred and role transitions are disturbed and more difficult to materialize. (This study covers ‘traditional’ mobile technologies– e-mail, mobile phones, the Blackberry – but preceded the advent of the iPhone).

We study the practices adopted to manage the dematerialization of distances which decontextualizes interactions and the blurred boundaries it involves. Three different practices emerge: (1) construction of a meta-role that encompasses all the different roles that can be enacted by the individual, (2) delegation of the segmentation to the technological devices by

the multiplication of email addresses or different ringtones and (3) multiplication of technological devices. Based on boundary approach, this study contributes to our understanding of the impacts of mobile technologies on space and individuals' reconstruction of idiosyncratic distances. It is laid out as follows. First, we introduce the benefits of mobile technologies and the drawbacks that they can generate. Then, we briefly present the boundary theory and examine the influence of mobile technologies on role boundaries and space. Then, the qualitative research methodology is presented with the different codes through which we interpreted the results, after which the different practices are presented and the implications discussed.

MOBILE TECHNOLOGIES AND MICRO-ROLE TRANSITIONS

Mobile Technologies: From Connectedness to Intrusion

Mobile technologies are a fast growing technology (Boretos, 2007; Jisun and Tugrul, 2010). They have improved life in terms of convenience, flexibility and connectedness (Chae and Yeum, 2010) and allow people to be called anywhere and anytime (Tribbia, 2006). Through these devices, individuals are displaced out of their private or work environment (Tribbia, 2006) and are now able to stay in contact with friends, family and colleagues wherever they go and at any time of the day. Moreover, the reducing costs of such technologies have democratized their use and transformed them into “common” tool for everyone's use. Such devices offer numerous possibilities and are more than just a calling device (Hjorth, 2008). Text messages have become more and more popular especially among young people (Tjora, 2011). Then, the miniaturization that has increased the memory capacity (Vihmalo and Lipponen, 2005) and features such as camera, MP3 player, gaming, address book, memo among others (Jha, 2007) have enabled people to personalize their device by

adding personal pictures, songs and so on. With mobile technologies, communications are therefore not embedded in specific contexts anymore and people can bring their environments wherever they go.

With face-to-face interactions, the context – such as the workplace, home or any other places – is similar for both parties. For communications with landlines, the situation is the same. When you call someone, you call the place where they are supposed to be. However, when technologies are mobile, people do not contact locations anymore but individuals (Ling, 2008). As you do not know where the person you are calling is, or what they are doing, the interaction has to be put in context by finding these things out. Moreover, given that the boundaries that were established by geographical contexts disappear, questions like “Am I disturbing you?”, “Can you talk about this now?”, “where are you?” become important to re-contextualize the conversation.

Merging all interaction contexts into one single device means that mobile technology users have to manage interactions that are usually separately contextualized. That is, split into different locations and communication devices: speaking or working with colleagues at work, enjoying lively conversations with friends and enjoying family meals, potentially, all at the same time. With mobile technologies, there is no need to be home to speak with friends or at the workplace to interact with colleagues. Users can interact with work colleagues, clients or suppliers while away from work and, more significantly, the work environment can interact with them when they are ‘off-duty’ and occupied with private matters and, conversely, private concerns can intrude on them when they are working. The person you are interacting with cannot figure out which environment you are in or which role you are playing – so the segmentation between roles disappears. Everyday life becomes decontextualized: everyone can be both real and virtual, and even simultaneously. Roles which have previously been clearly separated geographically are now integrated and locations are less associated with

specific activities. So the boundaries between roles are becoming blurred. Mobile technologies allow individuals to take their living environment, their music, their books and films, their pictures and games on MP3s, Smartphone and laptops wherever they go – so space and time are no longer determined as they used to be (Sheller, 2004).

However, individuals may become frustrated, challenged, annoyed and irritated by an increase use of mobile technology (Chae and Yeum, 2010). The omnipresence of mobile technologies in our daily lives and the fact that they make individuals reachable anywhere and anytime challenge the boundaries that were geographically and socially embedded, home and work-life demands can intrude into other spaces without any warning. We here use the role boundary theory first, to understand in which ways unplanned interruptions can affect individuals' roles and second, to describe individuals' practices around the use of mobile technologies.

Micro-Roles Transitions

Mobile technologies are connecting individuals everywhere at any time. While roles were related to specific locations and role transitions linked to physical mobility (Ashforth *et al.*, 2000), with mobile technologies multiple roles can be enacted simultaneously. Agility in managing multiple roles influences individuals' work effectiveness, the personal satisfaction and the balance that can be achieved between working and private lives (Kreiner, 2006). It also affects the ways to manage the necessary transitions between these roles (Rothbard *et al.*, 2005). Conceptual work in boundary approach provides a valuable framework that focuses on the different ways in which individuals create, maintain and modify boundaries in order to simplify and classify their environments (Ashforth *et al.*, 2000), as well as a set of propositions to understand the implications of how individuals manage multiple roles. However, a key open question concerns the specific strategies individuals use to manage these between-role boundaries.

While several studies have considered the transitions between work and private life and their consequences (Desrocher and Sargent, 2004; Greenhaus and Beutell, 1985; Hall and Richter, 1988; Nippert-Eng, 1996; Pleck, 1977; Rothbard *et al.*, 2005; Zerubavel, 1996), the impact of such mobile technologies on these transitions remains on shadow. Mobile technologies are a primary a mean by which individuals can be in touch with multiple worlds – that is, to reach and to be reached – in any place at anytime. Although they reshape distances and geographical barriers, enable individuals to feel close while they are actually geographically distant (Wilson, 2008), they can also place demands on individuals to make unexpected and unscheduled transitions. Ashforth *et al.* (2000) define role transitions a “boundary-crossing activity where one exits and enters roles by surmounting boundaries” (p. 472). For instance, a manager who receives a private call at work will have to suddenly exit from one role and enter another, which can lead to negative effects on the realization of the work task (Ashforth *et al.*, 2000). It is, therefore, important to understand the nature of what practices individuals employ for handling these micro-role transitions, and analyze the strategies they adopt both to integrate and to separate their multiple work and non-work roles.

Boundary approach provides a valuable theoretical lens to understand how individuals managing multiple roles navigate across their work, home and third place (e.g., leisure, sport and church) boundaries. According to role theory, boundaries are partly set geographical contexts: locations and places situate actions, and set up context, and roles are more or less embedded within locations and contexts (Ashforth *et al.*, 2000). Thus, mother, manager, wife, sister and daughter are different roles that can be enacted in the same day by only one person, but each is related to a specific location or context, such as workplace and home. As Greehaus and Beutell (1985) argue, while we expect a manager to be self-reliant, emotionally stable and objective, we would expect a mother or a sister to be more warm, emotional and vulnerable in interactions with her family. Moving from one role to another necessitates an individual

making micro-role transitions to adjust to the demands of the next role (Ashforth *et al.*, 2000). Mobile technologies and the convergence amongst the different devices are blurring the boundaries, spatial markers and role transitions. Role boundaries may include environmental aspects (such as geographical location), issues of relating to different individuals (work colleagues, family members, social contacts), specific times, etc. This is these linkages between role requirements and aspects of the environment that make the boundary theory fruitful to understand how role boundaries are challenged in everyday interactions. To develop this contribution, some concepts related to role transitions must be clarified.

Benefits and Costs of Role Segmentation and Integration

Boundary approach studies the way in which individuals erect boundaries around roles such as work, family and third places (e.g. leisure). These boundaries are both spatial and temporal, and can be enacted in such different ways. Continuum between segmentation and integration does exist (Ashforth *et al.*, 2000) but mobile technologies blur boundaries, reduce spatial markers of the roles and reinforce continuum. While segmentation refers to the clear delineation between different roles (such as work and family), integration implies a situation where roles overlap (Ashforth *et al.*, 2000; Edwards and Rothbard, 2000; Rau and Hyland, 2002; Nippert-Eng, 1996). For example, individuals who highly segment their roles will be less likely to take work at home and mix their different environments while those who integrate their roles would be more likely, for instance, to introduce work colleagues to their family (Nippert-Eng, 1996).

Ashforth *et al.* (2000) argue that only a few individuals prefer complete segmentation or full integration. They are usually located on a segmentation/integration continuum characterized by two concepts: permeability and flexibility. *Permeability* describes the degree to which an individual can be physically involved in a role but psychologically concerned with another one (Hall and Richter, 1988; Pleck, 1977) – thus a manager who answers private

phone calls or allows personal visits in the workplace has a permeable work role boundary. *Flexibility* describes the degree to which spatial and temporal markers can be changed (Hall and Richter 1988) – as, for instance, a researcher who finishes an article overnight in his home locations has flexible work role boundary. So, roles with permeable and flexible boundaries are likely to be highly or even totally integrated. Such boundaries are easy to cross and individuals will have little difficulty in enacting any role in any location, at any time – with the result that the roles themselves become increasingly poorly differentiated. Conversely, a role with impermeable and inflexible boundaries will be highly or even totally separated from individuals' other life-roles. Such roles are strongly differentiated and transitions between roles are more difficult, with boundaries reinforced, for instance, by the requirement for mobile phones to be switched off in classrooms, operating theatres, auditoria.

Role integration and segmentation vary also along a continuum. Both integration and segmentation of work and non-work roles are viable ways of managing multiple roles, and individuals' primary objective in making such choices is to minimize the difficulties of enacting their roles. Both tactics have benefits and costs: greater integration provides flexibility and enables employees to cope with the multiple roles they have to play simultaneously and reduces transition between roles, while segmentation preserves the independence of work/non-work lives and reduces stress and overlap between work/non-work problems, buffers employees against the spillover of one domain into the other.

Ashforth *et al.* (2000) argue that the primary benefit of segmentation is to reduce the 'blurring between roles' and clarify the transition between them, but at the same time increases the magnitude (and thus the cost) of the transition. In contrast, the benefits of integration are increased flexibility and permeability, but at the possible cost of poor role differentiation and spillover of negative effects between roles. Based on Ahrentzen (1990), Ashforth *et al.* (2000) as well as Kreiner *et al.* (2009), Rothbard *et al.* (2005), Sundaramurthy

et al. (2008), Table 1 presents the costs and benefits associated with each. Kreiner *et al.* (2009) report about such boundary violations as intrusion or distant violations like work-related phone calls at weekends. As they blur boundaries and decontextualize interactions, mobile technologies reshape the notion of space and proximity and blur the boundaries between individuals' life domains. However, boundaries remain idiosyncratic as they are not likely to be shared.

< Please insert Table 1 about here >

Research Question

Mobile technologies increase role permeability and allow everyone to be reached at anytime anywhere, as mobile media no longer contact locations but individuals (Ling, 2008). Role boundaries become violated, and home or work-life demands can intrude into the other space without warning to demand attention. First, these changes reshape distances: well-recognized social scientists such as political thinkers (Lefebvre, 1991), sociologists (Giddens, 1984), and geographers (Boschma, 2005; Harvey 1973, 1996) emphasize that space is multi-dimensional and is not only given by physical characteristics but is also constructed by actors and organizations. So, it is no longer just a 'distance' dimension separating near from far, but becomes an inter-individual construct which those individuals can define, locate, expand and explore. Wilson's 'Far but Close' concept (Wilson *et al.*, 2008) illustrates different dimensions of proximities: organizational, within multinational firms even when employees are distant and cognitive, amongst individuals who have the same knowledge but may not belong to the same organization or geographical place. For example, technologies such as conference calls or videoconference can make far-distant colleagues within the same

organization closer than co-located colleagues – we may barely say hello to a colleague in the office right beside us.

Second, actions and interactions are becoming decontextualized: the flexibility of spatial role boundaries enables individuals to enact their roles in difference locations, via telecommunications, or where a telecommuter enacts tasks at home rather than in her/his workplace (Rau and Hyland, 2002). More generally, as role boundaries are more or less embedded in social domains (Ashforth *et al.*, 2000), greater spatial flexibility and role boundary permeability means an individual who is working is more likely to be interrupted by family, friends or other private contacts (Rau and Hyland, 2002), creating overlaps between work and family roles that can be sources of conflict (Greenhaus and Beutell, 1985) which as Kossek and Ozeki (1998) argue are negatively related to both job and life satisfaction. Segmented roles, given their impermeability characteristic, tend to limit cross-role interruptions (Ashforth *et al.*, 2000) and thus enable individual to concentrate on their role more thoroughly.

We here refer to Weick's (2003) definition of practice as "equated with doing, concreteness, understanding, know-how and wholes" (p.454). **When distances are blurred and when those interacting are unable to identify the role of the speaker, mobile technology users must restore the communication context. Which are the practices by which individuals reshape the boundaries amongst roles, the practices to restore role transitions with the use of mobile technology devices?**

METHODOLOGY

Data Collection

Our contribution draws on the analysis of twenty three interviews about the use of devices such as laptops, mobile phones, etc. to show how mobile technologies blur the boundaries between social groups and thus, blur role boundaries and make role transitions more difficult. Mobile technologies that have been studied here are mainly traditional mobile phone, blackberry and emails. To study individual practices, we used a two stage inductive approach, first to identify the specific practices individuals use to manage role boundaries using mobile technologies and second, to categorize and link these practices to theoretically-meaningful role management functions.

To reveal the different practices around mobile technologies and practices to socialize (or not) roles and role boundaries, we conduct twenty three case studies of individuals about their use of mobile technologies – mainly traditional devices such as laptops, mobile phones, Blackberries and e-mails. Our contribution draws on the analysis of data collected (interviews, use of mobile technologies, description of mobiles devices and how they connect or not to other devices, etc.). Comparative mini case studies are ideally suited to focus on processes, when the investigator has limited control over events and over the boundaries of the phenomenon (Yin, 2003). It also allow the study to benefit first from a thick description of each case (i.e., here, mobile technology practices) and second, to explain which processes occurring in local contexts (Van Maanen, 1979; Miles and Huberman, 1994). The first author interviewed professionals and post graduate students during their travel time, the principal time when individuals used their mobile technologies for communication (phone, text messages, emails), to listen to music, to surf the Internet; in other words, to set boundaries, to erase distance, and to change their role or their involvement in their roles. As the interviewees

were not situated within a particular role (e.g., home or work), but in a transition period, it enabled us to explore in more depth the flexibility and permeability of their role boundaries.

We choose to study mostly young professionals who have an intensive use of mobile technologies. The sample was built by a snowballing technique, in which interviewees suggested other potential subjects. They represented a wide range of occupations including post graduate students, an attorney, top level manager, civil worker, professor, architect, and actress, with a mean age of 29 years. The sample of persons is not representative. We target post graduate students and young professionals as they have not ‘settled down’ yet into a specific environment where roles are clearly defined, but were more likely to meet multiple new worlds in their developing professional life and work experience, as well as sometimes discovering a new geographical location. In this way, during this macro-role transition (Asforth *et al.*, 2000) such as passing from student to professional this category of individual may experience several new roles, which may not necessarily be well separated from each other. In addition, young individuals are more likely to adopt and to use multiple technological devices and investigate different ways to communicate with their environment. Interviewees were asked two questions about their trips between leaving home and the interview beginning: (1) “What have you done and who have you interacted with during your travel time?” (e.g., read, text message, make phone calls, listen to music) and (2) “What did you bring with you from home?”

Interviewees were also asked which mobile technologies they used and which devices were used for in the work and non-work domains. For each device, interviewees were asked when they use it and for what purpose – either work or non-work related reasons. Then, they were asked whether they answer private calls or emails at work and *vice versa* and how they manage the interruptions and whether they felt interrupted or not. In this way, inspired by C. Nippert-Eng (1996), we asked to what extent interviewees felt that they integrate or separate

their work and non-work roles. For example, interviewees who segment these roles described practices such as dedicating specific mobile technology devices to only one role.

Data Analysis

All interviews were recorded and taped, and analytical tools included literal transcription, manual coding, and identification of relevant citations. We wrote a memo for each interview consisting of four main areas: (1) origin and destination of interviewee's trip and reasons of the trip?; (2) the mobile technologies they usually used in this kind of trip and in which ways; (3) interesting or unexpected quotations from the interviews, etc., and (4) the interviewee's understanding of space and ways of socializing space and boundaries.

In the first place, following our theoretical framework, these memos enabled us to understand to what extent individuals integrate their multiple environments within their devices on the one hand, and to identify the benefits and drawbacks (Chae and Yeum, 2010) they have from using mobile technologies on the other. This first analysis has been essential to our study to clarify the different uses that are possible with a single device such calling, sending and keeping text messages, taking pictures, listening to music, etc. (Hjorth, 2008; Jha, 2007) as well as to identify how individuals deal with intrusions. We used a grounded theory approach (Glaser and Strauss, 1967) to sort out the data which led to an interpretive and inferential coding. We focused especially on how individuals used their mobile technologies and how they configured them to manage their boundaries, and identified different types of practices regarding mobile technologies from the transcriptions. In a similar vein to C. Nippert-Eng (1996), we found that individuals segment their roles, to greater or lesser extents, either by using more (or fewer) mobile technology devices or by using them differently. We clarified this first insight by categorizing quotations that on one the hand identified either role segmentation or role integration and on the other, give information about interruptions from other roles and how interviewees felt about these intrusions. The next step was to identify

how people dealt with such interruptions, and how they modified the way they used mobile technologies, or reconfiguration their mobile devices, so as to be able to manage them better.

In the second place, we focused more on users' practices (Weick, 2003). As noted above, since mobile technologies dematerialize distances and space and blur role boundaries, enabling people to be reached anywhere and at anytime, their roles can become more and more integrated, whether they like it or not, leading to role boundary issues. So individuals attempt to adapt how they use mobile technologies and to rebuild role boundaries in different ways. As noted earlier, roles are neither totally separated nor totally integrated, but their degree of overlap can be located between these two extreme points. Our empirical observations illustrate another dimension of use: individual users' integration or segmentation of their mobile technologies – i.e., their tendencies either to use one single device for all their roles, or to dedicate specific devices to specific roles. We therefore classified the different practices we observed according to these two dimensions: segmentation or integration of roles or of technologies.

< Please insert Table 2 about here >

FINDINGS

Text Messages and Other Uses of Mobile Technology

We identified a wide range of different uses of mobile technologies during transportation. From private to professional calls, via text messages, music and so on, mobile phones are more than just calling devices (Hjorth, 2008). We found interesting to emphasize the use of features such as text messages and pictures as they reveal both a way of interaction and of

personalization of the device that have been made possible by the increase of the memory capacity (Vihmallo and Lipponen, 2005).

Mobile technologies are widely used as storage devices in order to convey some elements of different environments such as professional documents and contacts, private pictures, text messages, etc. Roles may involve environmental aspects (Ashforth *et al.*, 2000) which facilitate their enactment - as Pratt and Rafaeli (1997) point out, nurses enact their work roles within the hospital environment, wearing their lab coats. But, as mentioned earlier, work and non-work roles are not always so geographically embedded, and role boundaries can be flexible. With mobile devices, rather than being tied to a specific environment and role, individuals can take some elements of their environments with them and therefore enact any of their roles whenever and wherever they want. In our study, this ‘transported environment’ took the form of texts or pictures which users stored or sent either to recall or to connect to a specific role. We first identify that these functionalities are used as portable memory that individuals take with them so that they can connect with a specific environment when they want to: their pictures and texts make their mobile devices more personal to them, and connect them with specific roles:

“There are some SMS that I keep, like happy New Year or the funny ones. I can connect with my mobile. It’s more personalized” (Female, 25, professional)

People can carry their home wherever they go – their mobile devices give them proximity with their friends and family wherever they go and whenever they want. They can enjoy interactions in their personal relationships, be together and share moments, even if they are not in the same place; distances become idiosyncratic and no longer geographical. The flexibility involved enables individuals to take their ‘close’ environment with them, and maintain such relationships by receiving private calls or e-mails while being at work, on a trip or shopping, etc. The advents of Blackberry and Smartphone have emphasized these capabilities and uses, promoting mobile technologies as more than simple technological

objects that enable individuals to make and receive private and professional calls, send messages, or merely keep in touch with their friends, but as a mean to stay closer to the notion of 'home' – one could say that people use mobile technologies as an attic where they can go sometimes to keep souvenirs and remember experiences.

The immense amount of storage involved in digital memory means that individuals not only keep more and more souvenirs from their everyday experiences, but they also have them all the time, stored in their electronic memory. Mobile technologies work as a memory extension to become a vector of personal history. Firstly, individuals keep SMS to remember past relationships, happy moments with friends: *"I keep old sentimental SMS, sometimes I read them, and it makes me happy."* (Female, 26, master student). Keeping personal SMS or giving different ringtones to specific callers allow users to add a personal touch to their object: *"I can create a connexion with my mobile phone, it is customized"* (Female, 26, master student). In the same way, individuals can keep pictures on their mobile phones both to remember good moments and to share them: *"If I see something funny I shoot it and then I send it to my friends"* (Female, 23, master student). As we mentioned earlier, mobile technologies reshape the notion of proximity.

Between Simplified Transactions and Intrusion

Mobile technologies have substantially reshaped space and boundaries – most individuals can be easily reached wherever they are. So roles have become more integrated than they used to be and boundaries more flexible. Interactions have become decontextualized and roles more and more embedded in these interactions than in specific locations: who we are talking to is more important than where they are. Mobile technologies allow us to concentrate all our networks, so we can enact any of our roles from wherever we are. Mobile technologies are a way to reduce transitions to minimum. Individuals no longer seek to enact just one role at once and to tie it to specific time or space. They rather want to function in a 'space' where

their roles overlap. This ‘overlap space’ can be materialized by a specific mobile technology which concentrates or ties all an individual’s roles together, so he or she can enact them where and when it has been decided or required by an exogenous event.

“If I forget my mobile I feel lost. There is a lot of information about me inside. That’s the central thing in my life, I organize everything with it. My mobile is my way of contacting people. As I always have it with me and it’s switched on every time, people can contact me at any time.” (Female, 43, architect)

Where users’ roles are highly integrated, mobile technologies become part of the user, helping to establish their continuity and ubiquity and allowing them to fulfill their different roles simultaneously. Their role boundaries become blurred, and flexibility and permeability make roles more easily accessible. Moreover, Ashforth *et al.* (2000) argue that some individuals adapt to this blurring and permeability, and so are less affected by external interruptions – they accept the notion of living in this multi-role, overlapping space and no longer feel so disturbed by interruptions. However, those at the other extreme of the integration-segmentation continuum try to maintain the segmentation of their different life-roles, and feel invaded and disturbed by unplanned ‘out of role’ interruptions.

When boundaries are impermeable and inflexible, being reachable everywhere at any time becomes a cost rather than a benefit. By abolishing distances, mobile technologies speed up transitions and blur professional and private domains. As roles are located in space and time, individuals are not supposed to be disturbed by cross role interruptions. Thus, when this happens, crossing role boundaries becomes more difficult. Consequently, mobile technologies are seen like an invasion.

“That’s an intrusion from others in my life, in my own little world, which really pisses me off. [...] That thing [mobile], you’re always supposed to have it with you, to pick up. When you switch it off, somebody’s asking you: ‘Has your battery run out?’ But no, it’s meant to be this way.” (Male, 29, post-doctoral researcher)

“We’re harassed by devices: emails, online newspapers, mobile phone. We’re incessantly assailed by them. You have to shoot them down. They’re loud.” (Male, 30, faculty member)

Everyone has to play multiple roles (work, family, social, etc.) and so must learn to handle

transitioning from one role to another. However, feeling unable to control intrusions of one role into another one makes mastering role transitions more difficult. When roles (and thus interactions) become decontextualized, role boundaries may not be visible to others and unexpected or unscheduled interruptions may appear, so people need to rebuild the boundaries between their different roles to defend themselves against these kinds of issues.

High mobility and role flexibility lead to complete decontextualization of interactions between people. Thus, individuals' multiple roles are mixed together within the technological devices. In integrated role cases, we often found professional and private phone numbers mingled in the same technological device; family pictures and professional document in the same laptop; or private appointments written in a professional schedule. However, as people try to simplify their environment and minimize their role transition difficulties led by mobile technologies (Desrochers and Sargent, 2004), individuals tend to rebuild boundaries into technological objects to avoid role change and blurred boundaries.

Boundary-Building Practices

Meta-role. Individuals create meta-roles within which role transitions are reduced. The meta-role can be seen in such a neologism as 'mom-entrepreneurs' (entrepreneurs who also are mothers) who use their mobile devices to simultaneously manage their start-up, coach their kids, monitor the baby-sister and arrange with the maid when dinner should be ready. The integration of mobile technologies in a single device reflects the crystallization of the meta-role: the individual uses the same phone and email address for interactions with work contacts, family and friends. Calls, e-mails and all global interactions are thus both concentrated and made mobile – callers interact with the same person and change role as soon as the interaction begins. Interactions are completely decontextualized; the phone is not attached to any specific role nor ever disconnected. Although the creation of a meta-role decreases transition costs, it also increases the possibility of confusion, or that interactions

may be undesired, inappropriate or untimely. Such extreme role integration makes difficult for individuals to be fully committed to one specific role at a time – either work or family – and to concentrate on accomplishing the associated requirements.

“My professional and my private networks are highly mixed. Lots of people we work with become friends. [...] I use my mobile phone everywhere, in France, USA, etc. I check my emails with it and via Bluetooth, it can communicate with my laptop. When we are mobile, we have to simplify the communication and we reduce the ways of communication.” (Female, 43, architect)

Delegation. Individuals use mobile technologies to separate their various roles. This practice is materialized by the multiplication of email addresses. Using multiple e-mail addresses allows individuals to understand the different contexts of various interactions, and establish the boundaries between their professional and private roles and environments. The multiplication of phone numbers being not possible given their one-to-one links with specific phone devices, users can set up different in function of the person who is calling. In this way, the ringtone rebuild a boundary as the user will know the person who is calling and the sphere is related to. This boundary socialization reduces the costs of undesired interruption but still allows them the flexibility to cross voluntarily their different boundaries.

Individuals use the features of their mobile technologies to rebuild frontiers between their various roles – thus different ringtones on mobile phones can be attributed to contacts from different social groups.

“I converted my first email address into a mailbox for ads and online orders. I have another one for everything which is professional only and I have a third one for everybody, my friends, my family... Nothing from my job goes to that one.” (Female, 27, Attorney)

In this way, people know which domain they are going to interact with and thus which roles they must enact. However, these boundaries are only internal and personal – other are unaware of them – so they do not prevent from unexpected or unscheduled interruptions. But, they do defend the user from sudden interruptions. An individual is more ready to interact with a person related to the role is enacting. Instant messaging practices we observed (such as

the use of MSN) show people shield themselves from external interruptions by sorting out their contacts by groups.

*“I have my friends; I also have my family contacts, people from college who can become friends later, people I have met abroad. It is more where I have met them.”
(Female, 22, Post graduate student)*

However, although individuals rebuilt boundaries within their technological devices, boundaries remain idiosyncratic unless they are socialized. Before mobile technologies, boundaries were obvious for everyone since roles were associated with locations. Nowadays, the main challenge is to make our boundaries known to others, that is, to socialize and institutionalize them. Individuals need to give signals to others their practices in terms of mobile technology use. For instance, an automatic answer email from a mailbox: “I am away until the July 8th. In case of emergency, please contact...” clearly communicates a boundary to callers. Although mobile technologies mean anyone *can* be reached, anywhere, at any time, the disadvantage is that this capability often creates an expectation that individuals *will* be always reachable, as the following quote shows:

“E-mails are a real slavery. I communicate by e-mail but I’m a bit lazy. The failing of the speed is that people expect that I will answer quickly, now They take it badly if I answer slowly.” (Woman, 43, architect)

Thus, although technology allows full role integration, it is up to individuals to institutionalize boundaries as a way to manage those expectations. One individual’s attempt to maintain their boundaries was not properly understood by some of his contacts. In this case, an email address was supposed to be dedicated to private use whereas the other to professional use only.

“Normally, my emails are different from each other but there are some people who haven’t understood the implicit character of my request. They’re still writing on both.” (Male, 29, PhD student)

Sedentarization. The third, and most extreme, practice involves the geographically re-contextualization of technological devices and is materialized by their multiplication and geographical embedment. Laptops and mobile phones are entirely dedicated to specific roles

and – to a certain extent – to geographical locations with communications and interactions filtered by their use or non-use. This allows individuals to re-build the geographical boundaries that have been blurred by mobile technologies. This practice is also coupled with the multiplication of email addresses. Although consulting emails is not linked to a specific device, we noted that individuals using multiple devices tend also to separate their interactions whenever it is possible.

Boundaries can be rebuilt by dedicating particular devices to relate to specific roles, so that any interruption that comes via that device links with that role. This practice can improve individuals' focus on particular roles, and reinforces the segmentation of that role from others in their life.

“The mobile phone is related to my boyfriend and my close relations. The laptop is more related to my job, the second circle. The two circles are not very connected together.” (Female, 30, academic)

In a more extreme version of this practice, individuals can also stop interruptions by filtering out phone calls and emails. They filter out interruptions by choosing not to answer phone calls, and use the fact that their mobile device records the callers' ID to prepare how they want to interact with them. In the same way, people rebuild boundaries by switching off their mobile or not checking their emails, again protecting themselves against intrusion so they can focus on a specific role. They can also activate the silent mode on their mobile and throw it away in their bag or just wittingly 'forget' it and leave it on the table. Users set the priorities between their different roles and choose the role they want to deeply enact.

“There are some objects that cannot be ignored like the mobile phone. However, it's very pleasant, if I'm going to do the shopping, if I'm away for one or two hours, it's a real pleasure not to take my mobile.” (Male, 27, PhD student)

Another boundary-setting practice observed in our interviews was the difficulties in institutionalizing new boundaries with already-established contacts. As mobile technology practices and individuals' use of technology change, individuals may often have to

communicate their new expectations to others, which can lead to mismatches in expectations about mobile technology practices:

“When I’m at the office, there are some friends who call, and I know it’s going to be a very long discussion. Even if you tell them that you’re in the office, you don’t have the time; it’s difficult to get them to understand. I thus filter private messages on my mobile phone at work and professional ones at home” (Female, 27, Attorney)

< Please insert Table 3 about here >

DISCUSSION

The research design of this study has been inspired by a grounded-theory approach (Glaser and Strauss, 1967) to understand the uses of mobile technologies to integrate and segment roles. We based our work on a boundary approach, examining the extent to which individuals either connect or compartmentalize their roles and manage their micro-role transitions. The various practices they used to integrate or separate their roles were coded and we constructed a taxonomy of three general types of mobile technology practices (see Table 3). We observed in this study that mobile technologies make role identification more difficult. While landline calls enable the caller to understand the receiver’s context – work, home, etc. – this contextualization is not possible in mobile calls as individuals can be reached anywhere at any time. This role decontextualization and the fact that individuals are reachable in all their different worlds lead them to try to rebuild the role boundaries that have become blurred by mobile technologies. We identified three main practices associated with these rebuilding efforts. First, the construction of a meta-role – complete integration of the roles that are enacted by the individual – reduces the costs of the unplanned transitions by integrated all the different environments within the same device. This also has been made possible by the miniaturization and integration of numerous features such as agenda, memos, camera, etc. that

can answer the requirements related to all spheres. Second, delegation is a possible answer unplanned interruptions that can be costly (Ashforth *et al.*, 2000). The multiplication of email addresses and ringtones enable individuals to choose whether they want to be interrupted and to interact with another environment. Third, as a more extreme answer to unplanned interruptions, individuals multiply the devices in order to geographically embed them in a specific environment and fully dedicated the device to the role.

Mobile technology acceptance must integrate role boundary shaping

To better manage innovation in mobile technologies and to accompany the generalization of mobile devices, firms and innovators have to understand not only what is enabled by the technologies but also what the effects of mobile technologies on use are.

Two trends have important implications for how individuals shape their role boundaries and how they make the boundaries known. The first is the increasing and widespread usage of mobile technology, enabling anytime and anyplace availability. Individuals have come to expect that colleagues and friends are available regardless of whether they are in work or non-work roles. The second trend is the integration of mobile technology afforded by laptops, Smartphone, PDAs, and Itouch which enable individuals to simultaneously manage and to be present in multiple work and non-work roles at any time. However, while individuals using mobile technologies are expected to be reachable in any place at any time and the common sense supports this in an integrated manner, both positive and negative consequences are linked to the use of mobile technologies and individuals have very different practices to take advantage from the benefits and to avoid the problems that are related to them.

Mobile technologies erase not only distances but also the contexts in which the communication takes place. This dimension has been neglected so far. The generalization of mobile devices (mobile phone, laptop, Smartphone, etc.) not only changes the ways to reach

people and the perception of distances but also affects the ways mobile technologies are used – this leading to three different practices (meta-role, delegation, sedentarization) described above. Micro-practices reveal that contexts are necessary to communicate and contextualization of the communication is also a condition to better accept mobile technologies. The originality of this contribution is to underline the double dimension of distance, including geographic distances and the contexts of the communication. Indeed, the micro-practices disclose two dimensions of the communication devices: the facility to reach people and the context within which each person is interacting. Laurier (1999) emphasized the context when she analyzed why people reveal where they are when they are using mobile technologies. In the same way, Liccoppe (2004) emphasized the mediated role of technologies in the communication. We complement Laurier and Liccoppe's approaches by linking role transitions and mobile technologies.

Converging technologies and role integration

Because of mobile technologies, there is more role integration which minimizes the difficulties of enacting roles and the transitions between roles. Greater integration provides flexibility, enabling individuals to cope with multiple roles that they may have to enact simultaneously and reducing the transition efforts between roles. The creation of a meta-role goes in the same direction as mobile technologies erasing frontiers, distances and role definition, and reshaping new patterns of interactions. On the other hand, based on the contextualization of interactions and role segmentation to preserve the independence of roles and to reduce the stress associated with the overlap roles, the sedentarization of mobile technologies maintains patterns of interactions that existed before the spread of mobile technologies and buffers individuals from the spillover of one domain into another.

Table 4 describes the new ways of interactions induced by new technologies when we introduce micro-practices. To simplify the table, we group delegation and sedentarization

which reveals to be an extreme of case of delegation.

< Please insert table 4 about here >

Even if meta-role micro-practices mostly serve integration and delegation, and sedentarization serves segmentation, the last combination (delegation/sedentarization – segmentation) appears to be the most flexible. Individuals keep the monitoring of the interactions and are able to contextualize interactions. When a meta-role is combined with integration, contextualization of the interaction is more difficult and costly. The only way to monitor interaction is to switch on or off mobile devices. Such a switch may be a problem when mobile devices are not only use for communication but also as a memory for storing information, pictures, films, and even texts.

The primary benefit of the segmentation of technology is that it reduces the blurring of work and non-work roles (Ashforth *et al.*, 2000), whereas the cost is that it complicates the process and increases the cost of transitioning between roles. The benefit of integration is in increased flexibility and permeability, but it can also lead to poor role differentiation and possible spillover of negative effects between roles. Our study found that individuals' practices varied in terms of segmentation vs. integration, and that specific practices were used to maintain the individual users' preferences for one or the other. The use of technological devices to reintroduce role boundaries – including having separate devices dedicated to work and non-work roles, and using ringtones, instant messaging groups, and filtering processes to separate contact groups constitutes a first step to manage role transition. However, they are based on individual choices, ones erecting psychological boundaries, such as ignoring work or family calls when in the other domain, requesting work and non-work contacts only to use

specific e-mail address or phone number the user has assigned to that role. As the technologies advance, individuals increasingly use a wider variety of both types of boundary-management practices. However, such individual practices lead to psychological saturation as the interlocutors are not aware about the role played.

Future Research

The management of innovation in mobile technologies needs to integrate the identity and role dimensions. Identity is attached to each role, which Ashforth *et al.* label 'role identity' and define as a socially constructed definition of self-in-role (2000: 475) – in other words, the way in which an individual 'is' when enacted that specific role. The identity enactment depends upon the media to enact the role and mobile technologies are modifying boundaries and ways to express identity. The social identity theory in organizational contexts (Ashforth and Mael, 1989; Hogg and Terry, 2001) presupposes that people belong to various social categories which enable them to segment and locate themselves within the social environment. From this point of view, social identities already exist and individual integrate the values and beliefs of the group they want to belong to. For instance, an individual who strongly identifies with the organization they work for will tend to adopt the attributes of their organization (Ashforth and Mael, 1989). By identifying with different social identities, individuals can define who they are and to which social groups they belong, and thus locate themselves within the social structure. Identification to multiple social worlds raises the question of how individuals manage the multiple values, beliefs and norms involved. The boundary concept of boundary - and more precisely of 'role boundary' is very useful to understand the multiplicity of roles an individual has to manager.

By contributing to identity theory, our taxonomy helps innovation managers to include new dimensions within new product development, within new business model design and within the introduction of the couple service/product in mobile technologies. First, although

the concept of identity has become increasingly popular in the recent years, bringing boundary approach and information systems provides a more complete way to understand how mobile technology impacts both role boundaries and role identities. As our exploratory study illustrates, mobile technology sorely challenges individuals' role boundaries and thus their role identities. Multiple cross-role intrusions mean that individuals must re-socialized by adopting different practices of use (and non-use) of their mobile devices to rebuild their role boundaries and preserve their identities. The development of new services around mobile technologies can help this boundary rebuilding effort, and can convey specific identities (e.g., organizational, personal). Either by segmented a single device or by dedicating each device to a single role, individuals would be more able to avoid identity issues in their interactions. In the move toward technology integration, it is important to offer software for individuals to manage the desired openness of the technology as well as its connectedness.

CONCLUSION

The dematerialization of distance transforms 'objective' geographical distances, where an individual is or is not, into idiosyncratic distances. The paper shows the different practices through which individuals reshape boundaries into mobile technologies. As the latter connect individuals with their environment, rebuilding boundaries within mobile technologies enable people to choose a specific role they want to enact no matter where they are and the time it is. This exploratory study addresses a topical question related to the redimension of space in modern societies.

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Table 1: Costs and Benefits of Segmented and Integrated Roles

	Role Integration	Role Segmentation
Benefits	<ul style="list-style-type: none"> - Role weakly differentiated leads to simplification of the process of crossing boundaries - Highly integrated roles have similar identities - Frequent and easy transitions 	<ul style="list-style-type: none"> - Roles are associated with specific settings and time. Specific markers required to signal identity to members of the relevant role set - Higher segmentation leads to less distraction by role interruptions - Psychological compartmentalization of the different identities - Psychological movements are facilitated by rites of transition (dress code, etc.)
Costs	<ul style="list-style-type: none"> - Transitions less elaborated. Need for transition rites which are internal to individuals. See Ahrentzen's example (Ahrentzen, 1990) about rites of homeworkers to start working (have a cup of coffee, etc.) 	<ul style="list-style-type: none"> - Transitions between role are more difficult, costly, may be longer - Crossing role boundaries requires a process of role exit movement role entry with rites

Table 2: Types of practices

	Behaviors	Explanations	Illustrations
Role boundaries	Being connected	The place where individuals are does not matter. They want to be able to enact a role in any place at anytime.	‘I don’t lose important things anymore, that’s an extension of myself [...] When we have to move all the time, we have to simplify communications’ (woman, architect, 43)
	Being in touch	Individuals want people related to a role close to them in any place at anytime. Roles are decontextualized but interactions and boundaries are more or less maintained.	‘When I go shopping I take pictures and send them to my friends in order to ask their opinion’ (woman, postgraduate, 24)
	Being disconnected	Interactions from a role other than the one which is currently enacted are perceived as invasive.	‘Usually, I put my mobile in the external pocket of my back bag, I never hear it’ (man, PhD student, 29)
Practices	Integrating mobile technologies	Mobile technologies tend to be integrated as much regarding roles as possibilities of use.	‘I can read my emails on my mobile. I’m in touch with people by emails’ (Architect, woman 43)
	Segmenting mobile technologies	Mobile technologies tend to be segmented as much regarding to roles as possibilities of use.	‘The mobile and the laptop, each one has its universe. [...] I segment my life’ (woman, academic, 30)
			‘I have four email addresses: one where I have my personal emails, one with everything I’m not going to read such as junk mails, a professional mailbox from the school; and one professional email address that I created myself’ (man, 23, postgraduate student)

Table 3: Taxonomy of practices around mobile technologies and interconnections

	Definition	Practices
Meta-role integration	No boundaries, high degree of role integration through technology integration.	<ul style="list-style-type: none"> - checking email on mobile device - listening to music on mobile device - ways of communication are simplified - multiple uses for each object - same phone number for private and professional calls - same email address for private and professional uses
Delegation to technology	Boundaries are integrated within mobile devices and it is very difficult to socialize them as they are idiosyncratic and cannot be seen from outside (one phone number, on email address etc.)	<ul style="list-style-type: none"> -Different emails on the same laptop, different ringtones, etc. - different ringtones indicate the person who is calling - multiple email addresses - emails are filtered
Technological device multiplication	Boundaries are shaped and socialized.	<ul style="list-style-type: none"> - devices are dedicated to one sphere - non-use of the device while the corresponding role is not enacted - multiple mobile objects

Table 4: interactions between micro-practices and role transition

	Meta-role	Delegation and sedentarization
Role integration	<p>- Role transitions are easy and individuals who tend to integrate roles merge roles. Mix of work and non-work lives.</p> <p>-Mobile technologies are used to blur the frontiers in order to work from home and to integrate private life with work life.</p>	<p>Individuals who are splitting technologies to different uses keep the monitoring on the degree of integration and separation. They are able to interact with different networks and different groups without interference</p>
Role segmentation	<p>When individuals enact a meta-role, disconnecting from it and enacting one specific role is difficult. It leads to extreme behavior such as total deconnexion of mobile devices when they want to take holidays.</p>	<p>Mobile technologies are used to serve the segmentation of roles. Role transitions are more difficult and individuals balance flexibility and stress of playing multiple roles at the same time. They also balance transition efforts with the stress to be challenged all the time by continuous role breaks.</p>